REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-2, 4-6, and 8-9 are currently pending, Claims 1, 5, 8, and 9 having been amended, and Claims 3 and 7 having been canceled without prejudice or disclaimer. The changes and additions to the claims do not add new matter and are supported by the originally filed specification, for example, in original Claims 3 and 7.

In the outstanding Office Action, Claims 1, 5, and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Soltz (U.S. Patent No. 4,397,194) in view of Takeda et al. (JP Appl. No. 2001-329654, hereafter "Takeda I") and Takeda et al. ("Flow mapping of the mercury flow," hereafter "Takeda II"); and Claims 2-4 and 6-8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Soltz in view of Takeda I, Takeda II, and Huang (U.S. Pub. No. 2002/0011120).

With respect to the rejection of Claim 1 under 35 U.S.C. §103(a), Applicants respectfully submit that the amendment to Claim 1, which incorporates the features of previously presented Claim 3 and therefore does not present a new issue, overcomes this ground of rejection. Amended Claim 1 recites, *inter alia*,

> wherein a distance from the ultrasonic transducer to the outer surface of the fluid pipe contacting the wedge is made longer than a distance obtained from multiplying a velocity of the ultrasonic wave penetrating through the wedge by a time of dead zone that an ultrasonic oscillator of the ultrasonic transducer carries.

Applicants respectfully submit that Soltz, Takeda I, Takeda II, and Huang fail to disclose or suggest at least these features of amended Claim 1.

With regard to previously presented Claim 3, Applicants note that the Office Action did not cite to any of Soltz, Takeda I, Takeda II, or Huang to disclose "the distance from the ultrasonic transducer to the outer surface of the fluid pipe contacting the wedge is made

longer than the distance obtained from multiplying a velocity of the ultrasonic wave penetrating through the wedge by a time of dead zone that an ultrasonic oscillator of the ultrasonic transducer carries" Instead the Office Action takes the position that

> "if the distance is not longer than the dead zone distance, the transmitter will not be capable of detecting fluid flow at directly opposite the pipe wall. The dead zone is the time of dead zone multiplied by the velocity of the propagating wave. The distance must be long enough to allow the transmitter to detect a pulse, as required by the definition of dead zone; the amount of distance before which an ultrasonic transducer is incapable of detecting an object." (See Office Action, at pages 7-8).

Therefore, by stating that the "distance ***must*** be long enough to allow the transmitter to detect a pulse," it appears that the Office Action is taking the position that the features of previous Claim 3, which are now applicable to amended Claim 1, are ***inherently*** in the combination of Soltz, Takeda I, Takeda II, and Huang.

However, the Federal Circuit has stated that "to establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter ***is necessarily present*** in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. ***The mere fact that a certain thing may result from a given set of circumstances is not sufficient.***'"[1] (Emphasis added).

Applicants submit that the above-mentioned features are not necessarily present in the combination in which Soltz is the primary reference for the following reasons.

Applicants submit that Soltz describes a flowmeter using a time-of-flight method. The time-of-flight method in Soltz is a measuring method of receiving an echo signal reflected in the inner surface of a wall portion of the fluid pipe located on the far side across

[1] *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).

the fluid to be measured instead of a wall portion of the fluid pipe located on the near side where the ultrasonic transducer is attached (see col. 4, lines 35-40 of Soltz).

Therefore, Applicants submit that in the time-of-flight method in Soltz, it is important that the echo signal in the inner surface of a wall portion of the fluid pipe located on the far side across the fluid to be measured does not have a noise.

On the other hand, the invention defined by Claim 1 is directed to measuring the flow velocity distribution, and therefore it is important that an echo signal in a region on the near side of the fluid pipe does not have a noise. This is because if the echo signal in the region on the near side of the fluid to be measured is affected by noise, the flow velocity distribution does not exhibit a smooth curve with an error in the measurement result. Therefore, it is important that the distance from the ultrasonic transducer to the outer surface of the fluid pipe is made longer than a distance obtained from multiplying a velocity of the ultrasonic wave penetrating through the wedge by a time of dead zone that an ultrasonic oscillator of the ultrasonic transducer carries.

In contrast, in a case of the time-of-flight method in Soltz, since the echo signal in the inner surface of a wall portion of the fluid pipe located on the opposite side is what is important, it is not necessary to set to a specific value the distance of wave propagation from the ultrasonic transducer to the outer surface of the fluid pipe (such as "L x 1" in Applicants' Fig. 1) and the distance of wave propagation from the outer surface of the fluid pipe to the inner surface of the fluid pipe (such as "L x 2" in Applicants' Fig. 1) in the region on the near side of the fluid to be measured.

Therefore, Applicants submit that Soltz has a measurement principle completely different from that of the invention defined by amended Claim 1 and does not inherently disclose that the distance from the ultrasonic transducer to the outer surface of the fluid pipe is made longer than a distance obtained from multiplying a velocity of the ultrasonic wave

penetrating through the wedge by a time of dead zone that an ultrasonic oscillator of the ultrasonic transducer carries.

Accordingly, "wherein a distance from the ultrasonic transducer to the outer surface of the fluid pipe containing the wedge is made longer than a distance obtained from multiplying a velocity of the ultrasonic wave penetrating through the wedge by a time of dead zone that an ultrasonic oscillator of the ultrasonic transducer carries" recited in previous Claim 3, and now in amended Claim 1, is not ***necessarily*** present in the combination featuring Soltz as the primary reference, as suggested by the examiner.

Therefore, Applicants respectfully submit that the examiner has not made the required showing that the features of previous Claim 3, which are now in amended Claim 1, ***must*** be found in the applied art as is required by the Federal Circuit.

Therefore, Applicants respectfully submit that the examiner's rejection of previously presented Claim 3, as now applicable to amended Claim 1, is improper and must be withdrawn.

Furthermore, Claim 1 defines that "the distance of wave propagation from said ultrasonic transducer to the outer surface of the fluid pipe is an integral multiple of a half-wave length of an ultrasonic wave incident into the fluid to be measured" and that "the distance of wave propagation from the outer surface of the fluid pipe to the inner surface of the fluid pipe is an integral multiple of a half-wave length of an ultrasonic wave incident into the fluid to be measured."

Moreover, in a non-limiting example shown in Applicants' Fig. 1, both of the distance of wave propagation from said ultrasonic transducer to the outer surface of the fluid pipe (L x l) and the distance of wave propagation from the outer surface of the fluid pipe to the inner surface of the fluid pipe (L x 2) are an integral multiple of a half-wave length of an ultrasonic wave incident into the fluid to be measured.

The Office Action takes the position that Takeda II teaches that the distance between the transmitter and the wedge, as well as the wall thickness ***should*** be integral multiples of the half-wave length of the frequency incident to the fluid (see Office Action, at page 4, citing page 162 , equation 2 of Takeda II).

Takeda II is directed to a method of mapping a mercury flow contained in a stainless steel wall using an ultrasonic velocity profile (UVP). Takeda II describes the characteristics of transmission of ultrasound in various materials (see Section 2.1). Takeda describes that maximum transmission of an ultrasonic wave occurs at $d/\lambda = n/2$, where n is an integer. (See Section 2.1, Equation (2)).

However, Page 161-162 and Equation 2 of Takeda II describes only the ***wall thickness*** (see page 161, section 2.1 for example). Takeda II does not teach "the distance of wave propagation from said ultrasonic transducer to the outer surface of the fluid pipe," (such as "L x 1" in Applicants' Fig. 1).

Therefore, Applicants respectfully submit that Takeda II fails to disclose or suggest ***"the distance of wave propagation from said ultrasonic transducer to the outer surface of the fluid pipe is an integral multiple of a half-wave length of an ultrasonic wave incident into the fluid to be measured"*** and ***"the distance of wave propagation from the outer surface of the fluid pipe to the inner surface of the fluid pipe is an integral multiple of a half-wave length of an ultrasonic wave incident into the fluid to be measured,"*** as defined by Claim 1.

Therefore, Applicants respectfully submit that Takeda II fails to remedy the deficiencies of Soltz, Takeda I, and Huang with regard to Claim 1.

Thus, for all of the above reasons, Applicants respectfully submit that amended Claim 1 (and all associated dependent claims) patentably distinguishes over Soltz, Takeda I, Takeda II, and Huang, either alone or in proper combination.

Amended independent Claims 5 and 9 recite features similar to those of amended Claim 1 discussed above. Thus, for all of the above reasons, Applicants respectfully submit that Claims 5 and 9 (and all associated dependent claims) patentably distinguish over Soltz, Takeda I, Takeda II, and Huang, either alone or in proper combination.

Consequently, in light of the above discussion and in view of the present amendment, the outstanding grounds for rejection are believed to have been overcome. The present application is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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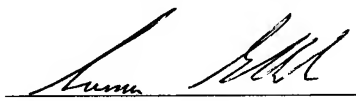

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